

Amendments to the Specification:

Please replace the paragraph on page 8, line 20, with the following amended paragraph:

Heat exchangers 36 (designated as HE₂, HE₃, etc.) are placed at various locations to ensure appropriate temperatures of the process gas entering the water-gas chambers and also the reaction chambers. The heat exchangers 36 are positioned upstream of each water gas zone 20. For example, the now-heated air emanating from the initial heat exchanger enters the reformer via an adjustable means of ingress 28 such as a stopcock, valve or some other fluid control device. Mixing zones 25 are present between the water-gas reaction zones (e. g., WG₂ 20) and the heat exchangers (e. g., HE₂ 36), and provide a means to homogeneously mix air with the reformat gas entering generated in the water-gas reaction zone.

Please replace the paragraph starting on page 9, line 4 with the following amended paragraph:

Downstream from the water-gas reaction zones are a plurality of reaction zones 32 (designated P₁, P₂, and P₃) for the preferential oxidizing of carbon monoxide according to the oxidation process as depicted in Equation 4. Air is injected upstream of the catalysts into the preferential oxidation catalyst zones to have ensure that the CO levels are within the specified range (during normal operation). Alternatively, the preferential oxidation zones are heated to their specified operating temperatures (during startup). Flow meters 34, such as standard mass flow controllers, are used to control the flow of air into the redox reaction zones 32.

Please replace the paragraph starting on page 11, line 2 with the following amended paragraph:

The startup process begins with the entry of fuel into the autothermal reformer 28 18 via a means to mix the fuel with air in a predetermined proportion. The mixing means is a multi-function nozzle which accommodates various phases and temperatures of fuel, air and water. Briefly, the fuel injection process proceeds as follows:

Please replace the paragraph on page 12, line 14, with the following amended paragraph:

When a vapor phase is utilized, the fuel is generally heated to a nominal temperature, e. g., for gasoline, the temperature is 200°C. If a fuel other than gasoline were is used in the vapor phase (e. g., a pure substance such as methanol, ethane, butane and other light hydrocarbons are possible.), the fuel is heated to just above the substance's boiling point. Selection of fuel also depends on the catalyst used.

Please replace the paragraph on page 14, line 27 with the following amended paragraph:

Figure 3 displays modeled temperature profiles along the lengths of the four water-gas shift reactor zones during startup. At $t = 4.5$ s, approximately the latter half of each shift reactor zone is still at room temperature. At $t = 2.10$ s, the temperature is clearly beginning to rise. At $t = 40$ s, the first three of the four entire water-gas shift reactor zones is at $> 300^{\circ}\text{C}$.